

15 inches deep. Washington, D. C., 4th, snow fell to the depth of from 12 to 14 inches on the level. Street car travel seriously obstructed.

**Largest Monthly Snow-falls.**—Emigrant Gap, Cal., 94 inches; Summit, Cal., 90; Cisco, Cal., 85; Mt. Washington, 54.50; Truckee, Nev., 49.50; Alta, Cal., 49; Princeton, Mass., 44; Westborough, Mass., 42.50; Dayton, Wash. T., 42.40; Newport, Vt., 39.55; Antrim, N. H., 38.50; Contoocookville, N. H., 37; New Market, N. H., 36.60; Lunenburg, Vt., 36.50; Boca, Nev., 36; Boston, and Grafton, N. H., 34; Woodstock, Vt., 30.75; Eastport, 31.40; Dexter, Me., 30.50; Worcester, Mass., 30.25; Rowe and South Lee, Mass., 30; Marquette, Mich., about 30; Colfax, Cal., and White Plains, N. Y., 29; New Bedford, Mass., about 27; Strafford, Vt., 26; New Shoreham, R. I., 25.30; Rochester, 24.60; Corinne, Utah and Deer Park, Md., 24; Somerset, Mass., and Ft. Myer, Va., 23.30; St. Paul, 22.60; Ashland, Wis., 22; San Geronio, Cal., 21.50; Amherst, Mass., 20; Northfield, Minn., 19.90; Dyberry, Pa., 19.50; Berryvale, Cal., and Helvetia, W. Va., 19; Kelton, Utah, and Port Jervis, N. Y., 18; New London, Conn., about 18; Charlotte, Vt., and Northport, Mich., 17; Escanaba, Mich., and Keene, Cal., 16; Prescott, Ariz., about 16; Fall River, Mass., 15.50; Newport, R. I., and Tehachapi, Cal., 15; Winnemucca, Nev., about 15; Johnstown, N. Y., 14.70; Freehold, N. J., 14.50; Washington, D. C., 14.20; Otega, Nev., 13.75; Catawissa, Pa., 13.40; Palermo, N. Y., and Southington, Conn., 13; Eagle Rock, Idaho, 12.70; Grand Haven, 12.60; South Orange, N. J., 12.25; Atlantic City, 12.10; Acotink and Wytheville, Va., Vineland, N. J., Chambersburg, Pa., and Carson City, Nev., 12; Port Huron, 11.90; Ogden, Utah, 11.88; Waterburg, N. Y., and Promontory, Utah, 11.50; Duluth, Minn., 10.80; Lynchburg, Va., 10.70; Ardenia, N. Y., 10.50; Pagosa Springs, Col., Halleck, Nev., Flushing, N. Y., Logan, Ia., Fallston, Md., Princeton, N. J., and Franklin, Wis., 10; New York City, about 10; Wells, Nev., 9.75; Manitowoc, Wis., and West Chester, Pa., 9; Sandusky, 8.80; Terrace, Utah, Moorestown, N. J., and Friendship, N. Y., 8.50; St. Vincent, Minn., 8.30; Fallsington, Pa., Lincoln, Neb., Cooperstown, N. Y., Coalville, Utah, and Moorhead, Minn., 8; Ft. Missoula, Mont., about 8; Ithaca, N. Y., Somerville, N. J., and New Athens, Ohio, 7.50; Albany, N. Y., and Neillsville, Wis., 7.30; Battle Mountain and Palisade, Nev., Red Bluff, Cal., Williamsport, Pa., and Phillipsburg, N. J., 7.

**Depth of Snow on Ground at end of Month.**—Colorado: Pike's Peak, about 6 inches. Connecticut: Southington, remains of drifts; New London, trace. Idaho: Eagle Rock, 3½ inches. Iowa: Ames, 4½ inches. Maine: Gardiner, 30 inches, Orono, 10 inches, Eastport, 7 inches. Massachusetts: Somerset, trace; Rowe, 20 inches; Amherst, patches in scattering places; Worcester, ground bare in many places; Springfield, 6 inches; Boston, 3 inches; Provincetown, 1 inch. Michigan: Northport, ½ inch; Marquette, 12 inches; Escanaba, 0 to ½ inch. Minnesota: Northfield, Moorhead and St. Paul, trace; Duluth, 4 inches; St. Vincent, 11 inches. Montana: Ft. Missoula, 4 inches; Helena, 1 inch; Nevada: Pioche, 4 inches. New Hampshire: Grafton, 16 inches; Mt. Washington, 29 inches; New Market, 13 inches. New Mexico: Santa Fe, trace to 3 inches. New York: Albany, 2 inches; Cooperstown, 4 inches; Ithaca, Oswego and Palermo, trace; Johnson, 4 inches; Pennsylvania: Catawissa, trace on hills; Dyberry, 6 inches. Rhode Island: Newport, none in open country, but in sheltered places small quantities remain from the heavy storm that occurred on the 4th and 5th. Utah: Salt Lake City, trace. Vermont: Burlington and Strafford, 6 inches; Charlotte, 4 to 8 inches; Newport, about 10 inches; Woodstock, 13 inches.

**Rain, Hail or Snow from a Cloudless Sky.**—Burlington, Vt., 1st, light snow at intervals during the day and night; 2d, 5th, 6th, 13th, 22d, 23d.

**Hail.**—Mobile, Ala., 28th, 11.30 a. m., lasting one minute; hailstones ½ inch in diameter. Mason, Tex., 27th, 7.50 p. m., last-

ing ten minutes; hailstones as large as pigeon's eggs. Fort Cummings, N. M., 27th, light hail. Camp Grant, Ariz., 19th, 10.30 to 11.30 a. m. San Francisco, 11th, 4.55 to 4.57 p. m.; 16th, 4.15 p. m. Los Angeles, Cal., 19th, 3 p. m., hail fell near the foot hills, 5 miles north and in Sierra Madre Mountains, 13 miles north of station. Visalia, Cal., 17th. San Diego, Cal., 1st, 7.22 to 7.25 p. m., hailstones were soft and about the size of peas; 17th, 12.20 p. m., small hail. Pt. San Jose, Cal., 15th. Presidio, Cal., 11th, 6.30 a. m. Fort Stevens, Or., 5th. Fort Townsend, Wash. Ty., 10th. Paterson, N. J., 21st, 5.45 p. m., heavy fall of hail lasting 10 minutes. Ardenia, N. Y., 21st. Clarksville, Tex., 27th, hailstones one inch in diameter.

**Sleet.**—The dates on which sleet fell in the various districts are given as follows: New England, 9th, 10th, 12th, 20th, 21st, 23d; Middle Atlantic States, 4th, 5th, 19th, 21st; Ohio Valley, Cincinnati, 21st; Upper Mississippi Valley, 2d, 17th to 21st; Missouri Valley, 17th to 22d; Southern Slope, 7th, 8th, 19th, 20th; Southern Plateau, La Mesilla, 2d, Ft. Verde and Camp Grant, Ariz., 19th; Northern Slope, Ft. Washakie, Wyo., 16th; Northern Plateau, Umatilla, Or., 22d; North Pacific Coast Region, 12th, 16th, 20th; South Pacific Coast Region, Visalia, Cal., 17th. Unusually severe sleet storms have been reported, as follows: Toledo, throughout the night of 20th and during the 21st a storm of rain, sleet and snow raged with great violence; telegraph poles were prostrated and great damage done to fruit and shade trees. Telegraph lines were down in every direction; all communication cut off. The principal cause of destruction to property was the heavy sleet, which prevailed over an area of country within a radius of 20 miles about Toledo. Damage estimated at over \$5,000. Port Huron, Mich., 21st, everything covered with a thick coating of ice. A telegraph pole, supporting 30 wires, was broken down under its weight. Ft. Madison, Iowa, storm commenced on 19th and continued during 20th and 21st; rain froze as it fell; ground was covered with a sheet of ice; trees were weighed down with ice, and many limbs broken off. Ft. Scott, Kan., 20th to 24th; trees heavily loaded with ice; much damage done. Yates Centre, Kan., 19th and 20th, all exposed objects covered with ice ½ inch in thickness; storm the severest of the kind that has been experienced here for 3 years; sleet covered the ground to a depth of 4 inches. Warrenton, Mo., 20th, trees covered with ice; many evergreens broken down. Dyberry, Pa., 21st, trees on the hills loaded with ice an inch thick; thousands of limbs were broken off and many whole trees fell. All trees looked like weeping-willows under the weight of ice. Embarrass, Wis., 20th, ground covered with a sheet of ice. Keokuk, 19th, 20th, rain freezing as it fell, weighing down telegraph wires, trees, etc. Rochester 20th, very violent storm began in the early evening, accompanied by high wind velocities from the south and southwest. The damage alone to window-glass and sky-lights reached thousands of dollars. Shade trees and telegraph and telephone wires were badly damaged.

**Drought.**—Deadwood, Dak., 27th, the small precipitation of past two months has caused great complaint as to scarcity of water in this city and in the rural districts.

#### RELATIVE HUMIDITY.

The percentage of mean relative humidity for the month ranges as follows: New England, from 71 to 81; Middle Atlantic States, 61 to 82; South Atlantic States, 65 to 79; Florida Peninsula, 71 to 73; East Gulf States, 69 to 78; West Gulf States, 64 to 83; Rio Grande Valley, 67 to 81; Ohio Valley and Tennessee, 67 to 72; Lower Lake Region, 70 to 79; Upper Lake Region, 72 to 82; Extreme Northwest, 61 to 88; Upper Mississippi Valley, 61 to 74; Missouri Valley, 62 to 74; Northern Slope, 54 to 69; Middle Slope, 52 to 60; Southern Slope, 61 to 82; Southern Plateau, 55 to 70; Middle Plateau, 50 to 71; Northern Plateau, 61 to 85; North Pacific Coast Region, Olympia, 82.8, Portland, 82.5; Middle Pacific Coast Region, 69 to 75; South Pacific Coast Region, 46 to 70. High stations report the following percentages not corrected for altitude:

Santa Fe, 52.9; Denver, 47.8; Pike's Peak, 73.0; Mt. Washington, 81.3.

### WINDS.

The prevailing winds during the month of February, 1882, at Signal Service stations are shown on chart No. II, by arrows which fly with the wind. Along the Middle Atlantic and New England coasts they are *northwesterly*. In the South Atlantic States, *southwesterly*. Between the meridians of 80° and 100° W., and from the Gulf northward to Lake Superior, *southerly*. In the Northern Plateau, Northern and Middle Slopes, *southwest to northwest*. In the Middle and Southern Plateaux, *variable*. In the North Pacific Coast Region, *southerly*. In the Middle and Southern Pacific Coast Regions, *variable*.

**High Winds.**—The following are the highest velocities attained on the summit of Mt. Washington, with direction at time of occurrence on the respective dates: 120 miles NW., 8th; 116, NW., 13th; 110, NW., 18th; 106, NW., 17th; 90, SW., 28th; 89, NW., 14th; 86, NW., 3d, and W., 19th; 85, NW., 6th and 10th; 84, NW., 16th; 82, NW., 11th; 80, NW., 4th and 15th; 76, NW., 20th; 75, NW., 12th. On all other dates during the month velocities reached or exceeded 50 miles per hour, with the exception of 23d, 24th and 25th. On summit of Pike's Peak the highest velocities reported are: 60, NW., 3d; 58, SW., 11th; 54, NW., 4th, W., 13th and SW., 18th; 53, SW., 17th, NE., 20th and NW., 28th; 50, W., 5th. Other stations reporting velocities of 50 miles per hour or over are as follows: Ft. Shaw, Mont., 62, SW., 14th. Stockton, Tex., 52, NW., 7th. Indianola, 56, SW., 28th; 51, N., 3d. Buffalo, 56, SW., 22d. Rochester, 56, S., 28th. Champaign, Ill., 51, SW., 21st. Eastport, 60, NE., 22d. New Shoreham, R. I., 64, NE., 5th; 60, NE., 4th. Sandy Hook, N. J., 56, NE 5th; 54, NE., 4th. Barnegat, N. J., 56, N., 5th; 50, NE., 21st. Cape May, N. J., 60, NW., 4th; 50, NW., 5th. Delaware Breakwater, 56, NE., 4th; 51, NW., 5th; 50, SW., 13th. Cape Henry, Va., 52, NE., 4th. Hatteras, N. C., 64, SW., 21st; 60, SW., 4th. Portsmouth, N. C., 52, SW., 4th and 21st. Umatilla, Or., 56, N., 16th. Thatcher's Island, Mass., 58, NE., 5th; 56, E., 22d.

**Total Movements of the Air.**—The following are the largest total movements at Signal Service stations: Mt. Washington, 27,334 miles; Pike's Peak, 14,257; Thatcher's Island, Mass., 12,277; Ft. Shaw, Mont., 12,189; Delaware Breakwater, 12,058; Cape May, 12,003; New Shoreham, R. I., 11,417; Portsmouth, N. C., 11,308; Hatteras, N. C., 11,285; Sandy Hook, 10,829; Kittyhawk, N. C., 10,353; Eastport, 10,314; Sandusky, 10,029; Barnegat, N. J., 9,848; Indianola, 9,807; Grand Haven, 9,447; Ft. Assinaboine, Mont., 9,446; Fort Benton, 9,134; Cape Henry, Va., 8,952; Milwaukee, 8,851; Chincoteague, Va., 8,545; Cheyenne, 8,540; Buffalo, 8,387; St. Vincent, Minn., 8,335; Boston, 8,095; Macon, N. C., 8,075; Alpena, 8,048; Madison, Wis., 8,008. The *smallest* are La Mesilla, N. M., 1,900; Visalia, 2,239; Florence, Ariz., 2,379; Lynchburg, Va., 2,600; Silver City, N. M., 2,641; Lewiston, Idaho, 2,712; Tucson, Ariz., 2,799; Ft. Missoula, Mont., 2,818; Augusta, Ga., 2,890; Salt Lake City, 2,952.

**Local Storms.**—Sitka, Alaska, December 19th, 1881. The following report of a most violent storm, although of late date, but from a very distant station, will be found of interest: Heavy gales, ranging from 30 to 50 miles per hour, accompanied by either rain, sleet or snow, began on the 5th, and continued to date. On the 19th, at 12.30 a. m., the gale increased to a hurricane, with violent gusts of over 70 miles per hour from the east, but no precipitation; temperature from 40° to 43°. At 1.55 a. m., storm showed no abatement in violence, at which time frequent observations were commenced with the following results: 1.55 a. m. barometer 29.06, thermometer 40°, wind E., 46 miles; 2.15 a. m., 28.99, 40°.5, E., 60; 2.36 a. m., 28.99, 40°, E., 64; 2.45 a. m., 28.98, 40°.5, E., 64; 3.07 a. m., 28.96, 40°.5, E., 62; 3.20 a. m., 28.96, 40°.5, E., 64; 3.30 a. m., 28.95, 40°.5, E., 64; 3.45 a. m., 28.92, 40°.5, E.,

66; 4.10 a. m., 28.89, 39°.5, E., 68; 4.30 a. m., 28.89, 39°, E., 56; 5 a. m., 28.82, 40°, E., 44; 5.30 a. m., 28.79, 40°, E. 46; 5.45 a. m., 28.80, 42°.5, SE., 44; 6.10 a. m., 29.04, 41°.5, SE., 41. At 6 a. m. the hurricane was terrible in the extreme, the castle (place of observation) rocked like a cradle and it seemed every moment as if the building would be moved from its foundation. At this juncture there was a loud crash as if the building were rent in twain and it shook more violently than before. Upon ascending to the roof a magnificent but awful scene met the gaze, sheet lightning flashed in fantastic shapes over the inky black sky, with fearful rapidity. Oceanward the waves were milky white with foam and their roar was heard above that of the storm. All the glass in the tower windows was broken and a portion of the roof blown away. The iron pointers beneath the anemoscope were so twisted as to be rendered useless. About this time the hurricane reached its maximum velocity, 80 miles, continuing for about five minutes. From this time until the following morning the storm gradually abated. 20th, 10 a. m., tide unusually high. In the harbor one steamer and a schooner, both of which were attached to a buoy, which was supposed to be immovable, had drifted over two cable-lengths from their original position. Most of the out-buildings along the beach were demolished and floated out to sea in small fragments. The roofs of a large number of houses in the village were seriously damaged, notably that of the castle, the church and the Custom House. Nearly all of the fences along the beach were prostrated. 11.30 a. m., gale abating; very heavy sea in the harbor. The bell-tower of the Sitka Mission House was thrown down in a perfect wreck. In the Indian village seven of the houses were unroofed and two of them partially destroyed. From various reports concerning the experience of many people in the village, it would appear very probable that a slight shock of earthquake occurred at about 6 a. m. or a short time before the occurrence of the maximum velocity of the hurricane. At 5.45 a. m. a quick, sharp report was heard, as if the building had been rent in twain. A few seconds after this report the large chimney of the guardhouse fell down, and in the Custom House a double door and frame work of solid logs was thrown down, the latter being separated from the side walls on the top and sides more than two inches. At the ware-house the outside entrance door had settled so much that it was only with great difficulty that it could be opened. In the office the floor and central wall were considerably disturbed and the clock which hung against the wall was found to be so far removed from the perpendicular that the pendulum touched the glass door. The direction of movement of shock was from northwest to southeast. The wind directions during the hurricane were from east slowly veering to southeast. The most violent gusts came from the south, veering slowly to the southwest and abating at a point a little west of southwest. The hurricane was one continuous, steady roar from east and southeast, changing its character to gusts of fearful violence from the south, with comparative lulls or calm spells at short intervals. 21st, 7 a. m., gale from the east increasing steadily up to 11.30 a. m., when a sudden gust shook the building with fearful force. The anemometer cups were carried away, but replaced again after a short interval. At noon found it impossible to take reading of the anemometer dial, owing to the violence of the wind and the thick, stinging sleet. The following observations were taken at short intervals: 11.19 a. m., barometer 29.04, thermometer 36°, wind E. 41 miles, cloudy; 11.30 a. m., 29.03, 36°, E. 40, cloudy; 12.10 p. m., 28.99, 36°.5, E. 42, sleeting; 12.30 p. m., 29.02, 35°, E. 44, heavy snow; 12.45 p. m., 28.99, 36°, E. 45, heavy snow; 1.15 p. m., 28.99, 36°, E. 36, light snow; 2 p. m., 28.94, 36°, E. 40, light snow; 2.20 p. m., 28.93, 37°, E. 47, light snow; 2.50 p. m., 28.94, 37°.5, E. 47, light snow; 3.07 p. m., 28.91, 38°, E. 44, light snow; 3.20 p. m., 28.90, 38°, E. 44, light snow. This storm, like that of the 19th, began with wind from the east, gradually veering to the south, when the temperature increased and a thaw and rain set in, continuing until midnight. Heavy gales, with rain or snow, con-